A Lean Six Sigma Approach to COTS IT Acquisition

By Allen C. Tidwell

Commercial-off-the-shelf (COTS) information technology (IT) supports the business of the Department of Navy (DON). The approach to acquiring COTS applications is resource intensive and involves a number of rigorous steps. While these steps protect the investment in IT, they can slow the acquisition process and inhibit the DON's need to take advantage of modern technology in a timely manner. The Assistant Secretary of the Navy for Research, Development and Acquisition (ASN (RDA)) has established goals that will aid in expediting this process. However, it will require considerable effort on the part of the acquisition community to look at how we do business to find opportunities for improvement in the acquisition process.

Not Just "COTS IT"

This discussion does not address "shrink-wrapped" COTS, those applications that can be purchased through local supply or enterprise-wide licensing, but rather those COTS applications that provide the business capabilities for an enterprise. Such COTS applications are characterized by higher levels of complexity, requiring process engineering and change management for implementation as well as cultural change for end users. Additionally, such COTS applications are more costly and generate considerable oversight interest.

Since they are applicable to the enterprise, they require a higher degree of technical expertise because of the number and types of external interfaces and migration of legacy data to the COTS application. Due to this size and complexity, these COTS applications generally impact organizational missions as well as the capability of a large number of users to do their job.

How does the DON acquire large, complex and costly COTS products? The Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management Framework defines a complex matrix of the activities, processes and products necessary to acquire these products. While this model provides some flexibility to the acquirer, it is oriented toward the documentation, evaluation, justification and decision-making support for weapons systems where specifics are required to determine exactly what is to be acquired.

On the other hand, business IT requires a capability to support a business function that can be adjusted or adapted to a proposed COTS solution. The current acquisition processes do not provide a flexible methodology for the acquisition of COTS software for business use in which tradeoffs in providing the user the necessary capability must be accomplished in an expeditious manner.

Other groups within the Department of Defense (DoD) are looking into ways to modify the current acquisition processes to provide a more flexible methodology to acquire business IT. Figure 1 is a summary of why it is so important to streamline the acqui-

Why Streamline COTS Acquisition

- *No enterprise COTS information technology acquisition model*
- *Current process is lengthy*
- *The Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management Framework is more suited to weapons systems*
- *Acquisition documentation development is cumbersome*
- *High costs associated with program delays*
- *Mandated by ASN (RDA)*

Figure 1.

sition process. So what can be accomplished within the context of the current processes to streamline the process and provide a more efficient and effective acquisition process for COTS IT?

Since no enterprise COTS information technology acquisition model exists, attempting to impose the current acquisition process on business needs often results in delays to program execution. Delays are costly resulting in reductions to the return on investment for as much as $165,000 per day for the Navy Standard Integrated Personnel System (NSIPS) or $3 million per month for the Defense Integrated Military Human Resources System (DIMHRS). In response to the need for an IT acquisition model, ASN (RDA) mandated that all Naval organizations follow the guidance in his Navy Marine Corps Acquisition Source Document – Blueprint for the Future. Several of the guidelines are below.

- Seek to continuously cut government and industry cost;
- Ensure that at least five Six Sigma events are held in each depot or industrial activity – government and industry;
- Seek to apply Six Sigma or theory of constraints in at least one area of business enterprise;
- Identify a set of internal metrics for the year, and plan to turn in a report card on these metrics;
  – One metric will be cost and schedule performance for all programs and activities under your leadership;
- Seek to reduce the volume of acquisition documents by 50 percent, including only essential, relevant information;
- Seek to have final approval of acquisition documents within the Navy Enterprise in no more than 90 days.

PEO-IT's Approach

In order to streamline the acquisition process and follow the guidance of the ASN (RDA), the Program Executive Office - Information Technology (PEO-IT) is applying the Lean Six Sigma methodology to the processes supporting the acquisition of business IT. For the purposes of this analysis, PEO-IT will use the Acquisition Documentation Coordination and Review Process as representative of the process since it touches all of the stakeholders involved and provides cross-functional participation.

Additionally, this process incorporates the ideals of the ASN (RDA) Source Document which defines that each PEO and program manager should have final approval for acquisition documentation within the Navy enterprise in no more than 90 days.

So what is "Lean" and how will it help us understand the process? Lean is a systematic approach to process improvement, which provides rapid benefits at all levels of an organization. It is a philosophy that forever changes the culture of organizations where it is properly implemented. And very importantly, Lean is a systematic method of identifying simple solutions to eliminate waste and produce services at the appropriate speed and quality to meet customer demands. (See Figure 2 for a summary of the principles of Lean Six Sigma.)

The PEO-IT applied this methodology to the set of processes described above, asking what is the value of the activities involved in the process. This generates a mapping of the value stream and an understanding of the sequence of activities and the triggers for that sequence. Figure 3 is an illustration of the approach used by the PEO-IT.

Following the documentation of the current state of the value stream, a team of Green Belts, who were trained on the improvement methodology of Six Sigma, broke the activities into phases for detailed analysis. They determined the inputs and outputs to
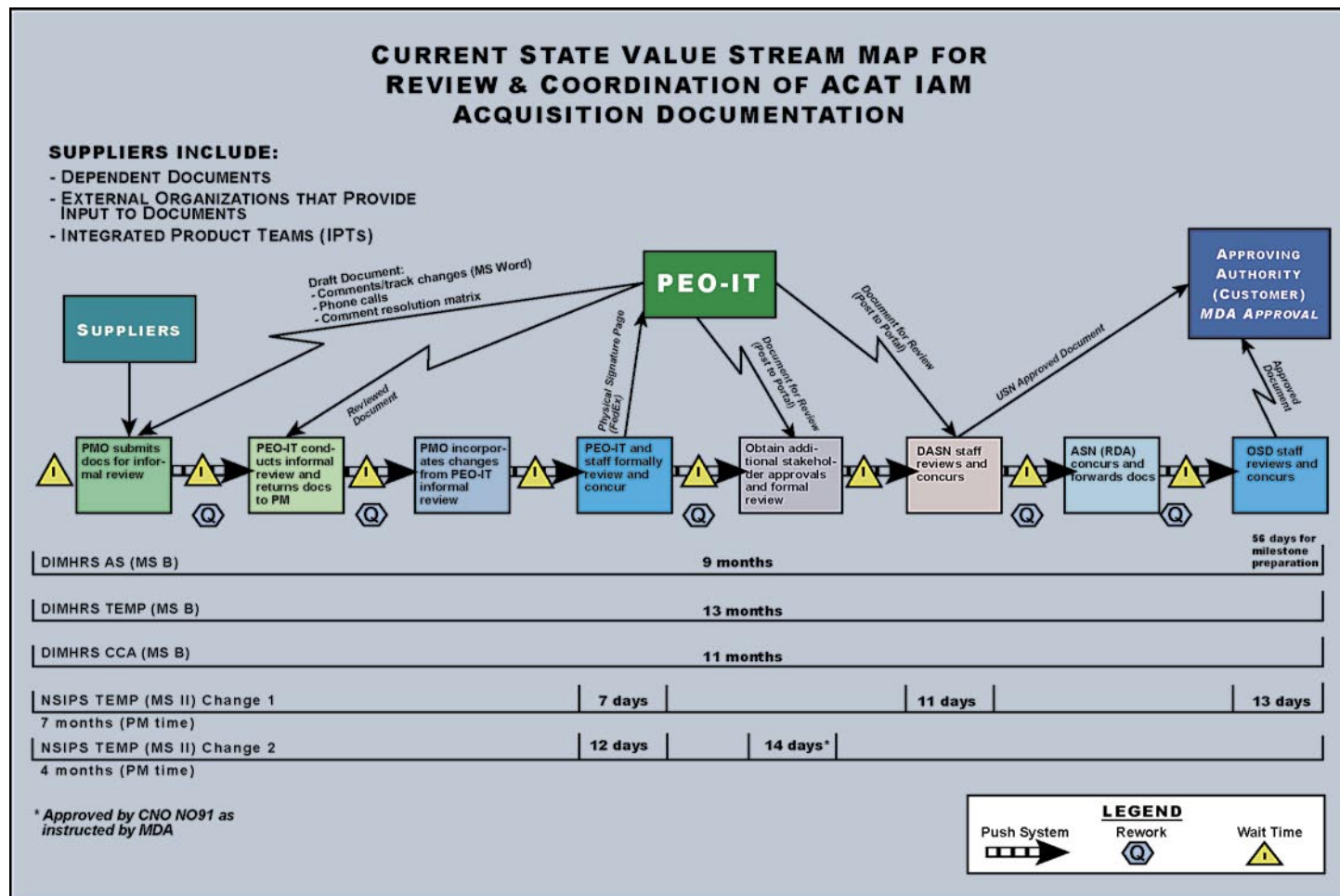
Principles of Lean Six Sigma

•Every job involves a set of processes
•Processes have inputs (from outside) and outputs (to customers, who are often within the agency)
•Efficient processes have flow — a natural, easy rhythm
•Wasteful activity disrupts flow, costs money, reduces efficiency, impedes communication and frustrates people.

Figure 2.

each set of processes. The next step was to identify the wasteful activity within the processes that disrupts the natural flow, costs money, reduces efficiency, impedes communication and thus frustrates people. The goal was to ensure the value stream is not sub-optimized to serve the desires of people, individual processes or departments.

The Phase I Future State Value Stream Map, shown in Figure 4, depicts a reduction in the process from seven value stream steps to four and a 64 percent reduction in the work effort. More importantly it shortens the cycle time from the variable 3 to 11 months to 46 working days, in addition to the document creation time. The document creation time is derived from the work package associated with the work breakdown structure (WBS).
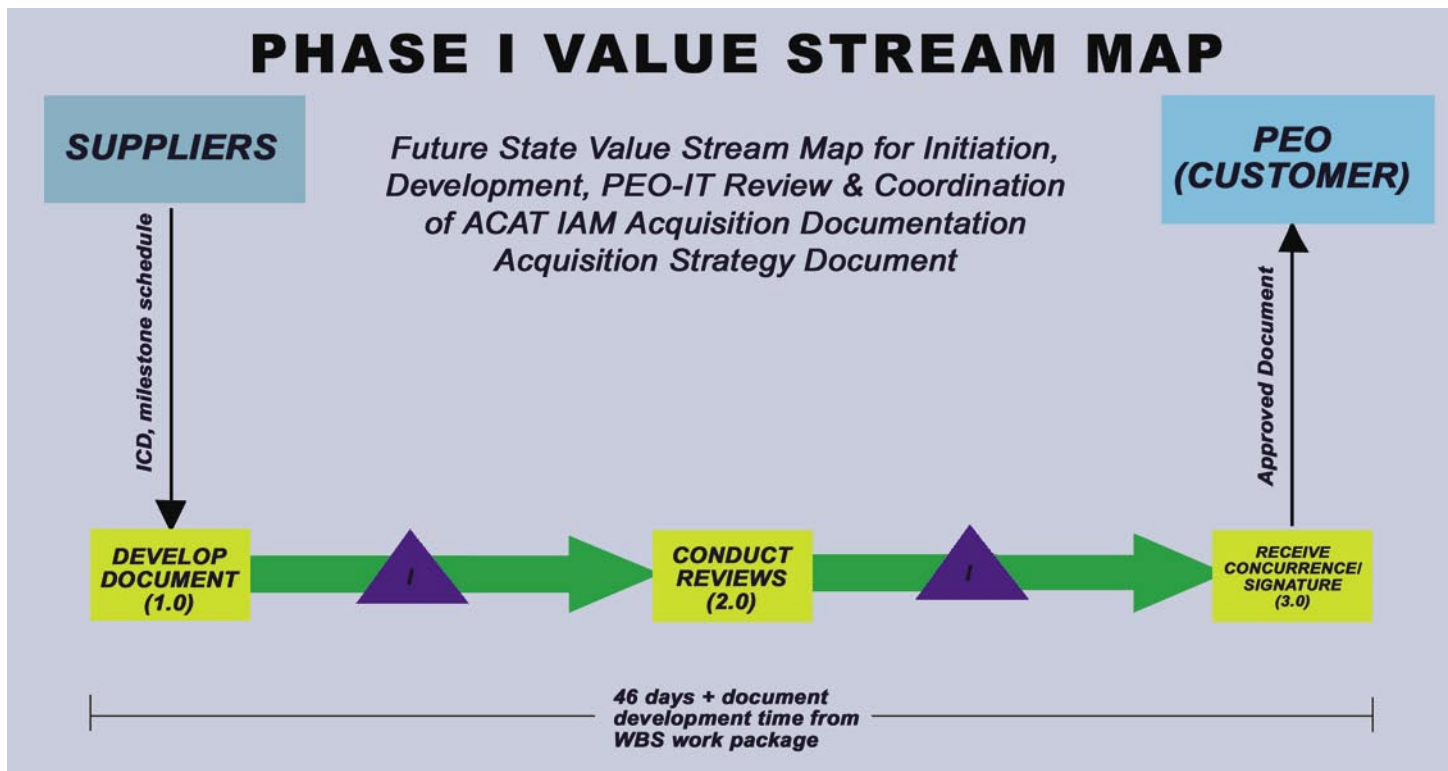
Figure 3.

CURRENT STATE VALUE STREAM MAP FOR REVIEW & COORDINATION OF ACAT IAM ACQUISITION DOCUMENTATION

PHASE I VALUE STREAM MAP

SUPPLIERS

Future State Value Stream Map for Initiation, Development, PEO-IT Review & Coordination of ACAT IAM Acquisition Documentation Acquisition Strategy Document

PEO (CUSTOMER)

ICD, milestone schedule

Approved Document

DEVELOP DOCUMENT (1.0)

CONDUCT REVIEWS (2.0)

RECEIVE CONCURRENCE/ SIGNATURE (3.0)

46 days + document development time from WBS work package

Figure 4.

Commercial-off-the-shelf information technology supports the business of the Department of Navy. The approach to acquiring COTS applications is resource intensive and involves a number of rigorous steps. While these steps protect the investment in IT, they can slow the acquisition process and inhibit the DON's need to take advantage of modern technology in a timely manner.

Other benefits include the development of a common business process within the PEO-IT for the initiation, development, coordination and review of acquisition documents with standardized tools to support the process. These standardized tools will also provide the capability to identify trends and cost and schedule impact through a set of established metrics.

This analysis also supports the PEO-IT effort to implement Software Acquisition Capability Maturity Model (SA-CMM) compliant processes. SA-CMM helps instill discipline into program and acquisition activities by building a set of repeatable processes — the *what* not *how*. Lean Six Sigma helps to identify those processes that are of value and becomes a default improvement model for ongoing process management.

The results of this analysis have application across the DON and DoD. It will form the basis for a new model in the acquisition of business information technology within the PEO-IT and support a paradigm shift in the acquisition process. The acquisition community will become involved earlier in the acquisition process with all stakeholders and customers.

The PEO-IT is participating with the Space and Naval Warfare Sys-

tems Command (SPAWAR) Lean Six Sigma Deployment Champions, the Deputy Assistant Secretary of the Navy for Logistics (DASN (L)) Transformation Team Leaders and the Office of the Assistant Secretary of Defense for Network Information Integration (OASD (NII)) to advance these concepts and communicate the results of the analysis across the Navy enterprise.

Lean Six Sigma efforts will accurately depict a microcosm of the model necessary to acquire and implement commercial-off-the-shelf IT as a basis for improvement. Lean Six Sigma efforts will enhance the acquisition process to enable industry and the DON to conduct business in a timely and efficient manner. The results of this effort, as directed by the ASN (RDA) and implemented within PEO-IT, will shorten the time to acquire COTS IT. It will support development of a model that streamlines the acquisition of COTS IT and provides a common process to support the acquisition community.

It is doing business smartly.

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